Solving by back-substitution: $\overleftarrow{\text{from back}}$

$$\begin{pmatrix} 3 & -1 & -2 \\ 0 & 8/3 & -2/3 \\ 0 & 0 & 3/2 \end{pmatrix} \begin{pmatrix} x_1 \\ x_2 \\ x_3 \end{pmatrix} = \begin{pmatrix} -1 \\ -4/3 \\ -7 \end{pmatrix}$$

$$x_3 = -\frac{14}{3}$$

$$x_2 = \frac{3}{8}\left(\frac{4}{3} + \frac{2}{3} \cdot \frac{14}{3}\right) = \frac{3}{8} \cdot \frac{40}{9} = -\frac{5}{3}$$

$$x_1 = \frac{1}{3}\left(1 + \frac{5}{3} + 2 \cdot \frac{14}{3}\right) = \frac{1}{3}\left(\frac{36}{3}\right) = -4$$

Then

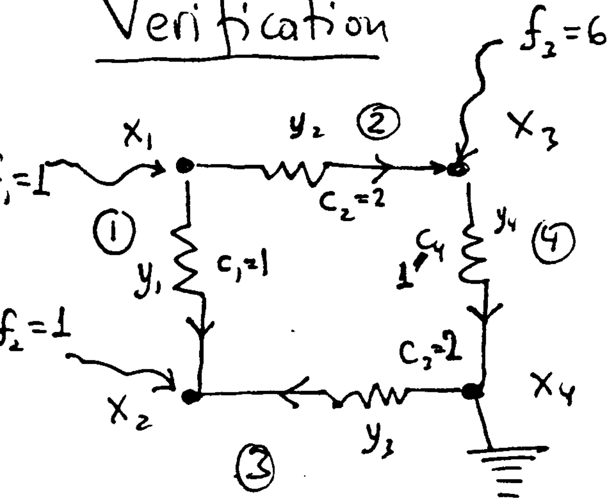
$$y_1 = x_1 - x_2 = -4 + \frac{5}{3} = -\frac{7}{3}$$

$$y_2 = 2x_1 - 2x_3 = -8 + \frac{28}{3} = \frac{4}{3}$$

$$y_3 = -2x_2 = \frac{10}{3}$$

$$y_4 = +x_3 = -\frac{14}{3}$$

Verification



$x_1 = -4$
$x_2 = -\frac{5}{3}$
$x_3 = -\frac{14}{3}$

$y_1 = -7/3$
$y_2 = 4/3$
$y_3 = 10/3$
$y_4 = -14/3$

~~$y_1 = x_2 - x_1 =$~~

node 1: $1 + y_1 + y_2 = 1 - \frac{7}{3} + \frac{4}{3} = 0$

node 2: $1 - y_1 - y_3 = 1 + \frac{7}{3} - \frac{10}{3} = 0$

node 3: $6 - y_2 + y_4 = 6 - \frac{4}{3} - \frac{14}{3} = 0$

(node 4: $-8 + y_3 - y_4 = -8 + \frac{24}{3} = 0$) compensation

Kirchhoff's loop law: $-y_2 + y_1 - y_3 - y_4 = -\frac{4}{3} - \frac{7}{3} - \frac{10}{3} + \frac{14}{3} = 0$